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12.1 V2

<Tim.Mosko@CH2M.com>
07/02/2008 12:33 PM

To Dave Tomten/R10/USEPA/US@EPA
cc
bcc
Subject FW: COPECs and Benchmark Screening

History: This message has been replied to.

Dave,

We've prepared a recommended COPC list as shown in the attached table. We started with Mike's list, then attempted to narrow it down, as practicable. Jeff's email below indicates that we should start with the USGS list of 11 COPCs plus uranium. After further consideration and talking some more with Mike Rowe this AM and reviewing the available data, etc, we expanded the list to 18 COPCs. Our recommendation of 18 COPCs is based on the following rationale:

1. Include all 11 USGS COPCs based on the USGS waste pile study (Sb, As, Cd, Cr, Cu, Mo, Ni, Se, Tl, V, Zn)
2. Speciate Cr (the USGS list only analyzed for total Cr)
3. Add any metal with a site max soil concentration that exceeds the Eco-SSL or HH-ORNL (or, if Eco-SSL is not available, compare the site max value to the Eco-ORNL benchmark). This adds, Mn, Hg, and Ag. Note that P4 might be able to demonstrate that the max value is not appropriate, but absent of any general statistical values, i.e., avg concentrations, for these metals at the site, we should keep them on the list until P4 can demonstrate that the analyte does not need to be sampled for.
4. Add uranium
5. Add Boron because site Bo data are not available and Bo was not evaluated in the USGS or the BLM reports.
6. Add Cobalt because site Co data are not available and the USGS background value for Co in shale is higher than the Eco-SSL

Based on this rationale, we dropped the following 4 analytes because they are not on the USGS list and their site max values are below the Eco-SSL: Ba, Be, Fe, Pb. We also dropped aluminum because it is not a COPC if the soil pH is > 5.5 (we've made this assumption without checking).

All 18 COPCs must be carried through to the RA. Note that background data were not used to screen out COPCs that would be evaluated in the risk assessment. However, as Jeff notes below, background can be used to screen out analytes for additional sampling if sufficient existing validated data are available to demonstrate reduced sampling.

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From: Schut, Jeff/BOI
Sent: Tuesday, July 01, 2008 6:36 PM
To: Mosko, Tim/BOI
Subject: COPECs and Benchmark Screening

Tim - read through this and see if you disagree with anything and want me to edit it prior sending to Dave

Tim and Dave - I added some screening benchmarks to Mike Rowe's table that were commonly used prior to the development of EcoSSLs. These ORNL benchmarks are fairly comprehensive, however some are notably conservative due to the uncertainty factors applied and exposure assumptions used.

Just to reiterate some of my thought from our discussion earlier today:

Considering the past regional studies related to phosphate mining, starting with a narrowed list of COPCs would be appropriate. The Area-Wide Risk Assessment considered historical studies and started with 21 metals and the USGS study identified 11 metals that are commonly elevated in waste-shale. Therefore, I believe it would be reasonable to start (as Mike Rowe originally did) with 11 plus uranium as the list of COPCs. These should all be considered COPCs for the risk assessment, however additional sampling data for all these metals may not be necessary in each medium. It may also be possible to collect a sufficient data set to demonstrate (during the risk assessment) that some are below background. Note that background data are not to be used to screen out COPCs that would be evaluated in the risk assessment, but can be considered when determining additional data needs. For Cr, we do not believe it is necessary to speciate all samples for CrIV, but they do need to demonstrate that CrIV is not present. Additionally, if a metal is a COPC in soil, then it should also be considered a COPC in vegetation, although the need for vegetation tissue analysis is a separate question. For some COPCs, vegetation tissue concentrations could be modeled conservatively based on available literature or any relevant area-wide

data. Soil-Veg_Screen_tables (2).xls

COPC	AWRA COPC List	USGS COPC List[15]	BLM COPC List[16]	Max Site Value (mg/kg)	CH2M HILL Recommended COPC List[17]	HH-ORNL soil screening levels[1] (mg/kg dw) Residential		Industrial		Eco-SSL[2] (mg/kg) Plants	Soil inverts	Avian	Mammalian	Eco-ORNL[3] (mg/kg) Avian	Mammalian
Aluminum				NS		77,000		990,000		NV	NV	NV	NV	NA	NA
Antimony		Yes	Yes	23	Yes	31	3	410	3	NA	78	NA	0.27	NA	0.25
Arsenic	Yes	Yes	Yes	57	Yes	0.39	4	2	4	18	NA	43	46	2	0.25
Barium				170		15,000		190,000		NA	330	NA	2,000	17.2	19.7
Beryllium				2		160	5	2,000	5	NA	40	NA	21	NA	2.4
Boron				NS	Yes[18]	16,000	6	200,000	6	NoSL	NoSL	NoSL	NoSL	24	103
Cadmium	Yes	Yes	Yes	120	Yes	70	7	810	7	32	140	0.77	0.36	1.2	3.5
Chromium III	Yes[14]	Yes[14]		1200	Yes	120,000	8	1,500,000	8	NA	NA	26	34	0.83	10000
Chromium VI				200	Yes	230	9	1,400	9	NA	NA	NA	130	NA	12
Cobalt				NS	Yes[19]	NoSL		NoSL		13	NA	120	230	NA	NA
Copper	Yes	Yes	Yes	170	Yes	3,100		41,000		70	80	28	49	38.9	55.7
Iron				38000		55,000		720,000		NV	NV	NV	NV	NA	NA
Lead			Yes	11		400	5	NoSL	5	120	1,700	11	56	0.9	29.3
Manganese			Yes	6100	Yes	1,800	10	23,000	10	220	450	4,300	4,000	825	322
Mercury			Yes	0.87	Yes	7	11	28	11	NoSL	NoSL	NoSL	NoSL	0.4	4.7
Molybdenum		Yes		41	Yes	390		5,100		NoSL	NoSL	NoSL	NoSL	2.9	0.5
Nickel	Yes	Yes	Yes	480	Yes	1,600	12	20,000	12	38	280	210	130	64	147
Selenium	Yes	Yes	Yes	360	Yes	390		5,100		0.52	4.1	1.2	0.63	0.33	0.73
Silver			Yes	9.1	Yes	390		5,100		560	NA	4.2	14	NA	NA
Thallium		Yes		2	Yes	5	12	66	12	NoSL	NoSL	NoSL	NoSL	NA	NA
Uranium				51	Yes	230	12	3,100	12	NoSL	NoSL	NoSL	NoSL	21	6
Vanadium	Yes	Yes		830	Yes	390	5	5,200	5	NA	NA	7.8	280	9.4	0.7
Zinc	Yes	Yes	Yes	3100	Yes	23,000	3	310,000	3	160	120	46	79	12	586